Software Release Notice

System: MGS   **Release:** McMurdo 4.5.1
Date: February 26, 2002

Modification Description:

McMurdo Station Upgrade

The following changes are planned for McMurdo Ground Station software. These modifications have been completed since the McMurdo3.2 release.

♦   Received from MGS, and modified, working version of NasaStart.

♦   Removed task that would attempt to poll frequency counter and change frequency during an uplink when lock has already occurred.

♦   Fixes the 1000 configuration file list problem and allows for name entries up to 13 characters and description entries up to 31 characters.

♦   Sends upgrade acknowledge to the Master even if the Master is already upgraded.

♦   Changes the remote interface to match Wallops version 3.1.8 and beyond with additional debug.

The following changes are planned for McMurdo Ground Station software. These modifications have been completed since the McMurdo3.0 release.

♦   Correct the AGC UIF displays.

♦   Correct the control of the uplink and test exciters.

♦   Correct the ability to start and stop sweep.

♦   Clear the correct remote interface queue.

♦   Start the status_l after starting all the ioh processes.

♦   Restores the shortened prepass feature to 45 seconds.

♦   Updates Version on GUI.

♦   Avoids queue overflows caused by status packets.

In addition, the following features from release 3.0 should also be validated:

These modifications have been completed since the McMurdo2.3 release.

1.   Does not force the ACU to a WB or NB mode prior to a test. Leaves the ACU in whatever mode is currently set, prior to beginning Boresight Tests or Servo Tests.

2.   Single Socket (Lien List Item #9)

3.   Hot handover Uplink (Lien List Item #2) - Start button on top level highlights when uplink is configured to off. Hitting start button starts a non-coherent uplink.

4. Correct Train Axis Positioning (Lien List Item #15) - Changes system default setting of train axis from 30 degrees to 70 degrees.

5. Geo-Sync Satellite Tracking (Lien List Item #20)

6. Improves the 80 Hz resolution of frequency for uplink.

7. Configures Bit Sync names from the sysdflt.ascii file. Adds AQUA Bit Sync in slot 3.

8. Improve calculation of pedestal rates for program tracking at high rates.

Files Affected:

The files that were developed and/or utilized as part of MGS 4.5.1 are listed in Attachment 1: MGS 4.5.1 FILES.

Hardware Requirements:

N/A

Validation Procedures:

MGS 4.5.1 will be validated through continued daily testing at NASA/McMurdo/10m for scheduled satellite passes. In addition, the following actions can be performed to validate some upgrades included in this release:

Restored Shortened Prepass

On the Schedule screen, choose a pass, which started slightly in the past (about one minute) or within one minute of the future. Hit the save button, and notice that there is a short prepass (about 45 seconds), rather than a 2.5 minute prepass, before tracking begins.

Forced ACU Mode Prior to Test
Set control to the Base C200. Set the ACU mode to WB. Run a lock-on-test. Notice that the ACU stays in WB throughout the test. Try changing the mode to NB and running the same test. Notice that the ACU stays in NB throughout the test. Repeat for other boresight and servo tests. Set control to the Shelter C200 and repeat the above tests.

Single Socket – ATS Master

Test the following with ATS Master Release 3.3 or later.
The following will demonstrate a remote schedule operation:

1. Generate a remote schedule file.
2. Demonstrate that the remote schedule can be loaded to the station controller then activated by the ATS Master.
3. Validate the remote schedule action by observing the schedule at the operator console.

Remote Ephemeris

The following will demonstrate the remote ephemeris operation:

1. Generate a remote ephemeris file
2. Download ephemeris from the ATS Master to the station controller.

3. Validate the remote ephemeris information by observing the data at the operator console.

Provides better frequency resolution for uplink

Set control to the Base C200. Run an uplink using the EO-1 Configured Frequency for the hp8780 of 2090.659999. Notice that when the uplink is complete, that the hp8780 is tuned to the same frequency.   Try the same test with different configuration files, some coherent, some non-coherent and with several different uplink frequencies. For each test, run a pass or simulated pass, let the computer perform the sweep function for each pass or simulated pass, then verify the displayed and output frequencies match the entered (configuration) values.
Set control to the Shelter C200. Repeat the above tests for the Shelter C200.

Changes the sysdflt.ascii file – Test of AQUA Modified Test Modulator

Set control of the system to the Base C200.
Perform the following tests with the unmodified Test Modulators.
RADARSAT 105 BER to Base Receiver
RADARSAT 85 BER to Base Receiver
RADARSAT 105 BER to Shelter Receiver
RADARSAT 85 BER to Shelter Receiver

Install the AQUA BSSC Modules in the BSSC unit's slot 3. On the X-Band Channel Screens for both Control/Status and Configuration, notice that the bit sync selections show AQUA in slot 3 and slots 1 and 2 are unchanged from prior releases and match the Bit Syncs currently installed in the Bit Sync Chassis. Check both X-Band Channel Screens.

Install the modified Test Modulator
Perform the following tests with the modified Test Modulators.
RADARSAT 105 BER to Base Receiver
RADARSAT 85 BER to Base Receiver
AQUA BER to Base Receiver
RADARSAT 105 BER to Shelter Receiver
RADARSAT 85 BER to Shelter Receiver
AQUA BER to Shelter Receiver

Switch control of system to Shelter C200. On the X-Band Channel Screens for both Control/Status and Configuration, notice that the bit sync selections show AQUA in slot 3 and slots 1 and 2 are unchanged from prior releases and match the Bit Syncs currently installed in the Bit Sync Chassis. Check both X-Band Channel Screens. Repeat above six BER tests using Shelter C200 for control.

Hot Handover

Configure a pass without uplink. Notice that the START SWEEP button is highlighted on the top-level screen. Hit the START SWEEP button and notice that a non-coherent uplink is initiated.

Train Axis Positioning

Set control to the Base C200. Notice that on passes for which the highest elevation position is less than 70 degrees that the train axis positions in such a way that the pedestal is tilted toward the spacecraft at the point of highest elevation – this will tend to cause the pedestal elevation angle to be higher than the earth elevation angle at that point.

Notice that on passes for which the highest elevation position is greater than 70 degrees that the train axis positions in such a way that the pedestal is tilted away from the spacecraft at the point of highest elevation. This will tend to cause the pedestal elevation angle to be lower than the earth elevation angle at that point.
Set control to the Shelter C200. Repeat the above tests.

Geo-Synchronous Tracking

Enter ephemeris for a geo-synchronous satellite and notice that the system can schedule a track for that satellite.   Schedule a track and see that the track performs as expected.

Improved Program Tracking

Set control to the Base C200. Compare Track Analyses with Fit Plot for Satellites before and after this change and notice smaller deltas after the change. Notice if this improves the performance for high elevation passes for Wire and Trace. Set control to the Shelter C200 and repeat the above tests.

Correct the AGC UIF displays

Set control to the Base C200. Notice that the bar graphs on the top-level screen are working with correct values shown.

Correct the control of the uplink and test exciters

Configure a pass without uplink. Notice that the START SWEEP button is highlighted on the top-level screen. Hit the START SWEEP button and notice that a non-coherent uplink is initiated. Go to the control/status screen for the exciter and change RF on to RF off for the uplink exciter. Notice that it correctly goes off.

Correct the ability to start and stop sweep

Configure a pass without uplink. Notice that the START SWEEP button is highlighted on the top-level screen. Hit the START SWEEP button and notice that a non-coherent uplink is initiated. Immediately hit the STOP SWEEP button and notice that the sweep stops and modulation is enabled.

Clear the correct remote interface queue

With the SCC connected to the Master, restart the Master. Notice that the SCC continues to operate correctly without requiring a restart.

Start the status_I after starting all the ioh processes

Notice that there are no errors in the terminal window when the code is started.

Known Bugs or Limitations:

Some open DRs may not be resolved in this release due to equipment constraints. ViaSat requests a total of 4 2-hour windows followed by test passes with preferably COBE to install new software, verify fixes and debug problems.

The following are limitations to the shortened prepass feature:

All of these limitations could result in loss of data.

a. Train may not have adequate time to position properly.   If a high elevation pass, and the Train is not at a proper position, the Azimuth may not be able to keep pace with the satellite near the point of closest approach.
b. Cable wrap may not have adequate time to position properly.   This could result in the pedestal reaching a limit in the middle of the pass.
c. There is inadequate time to zero the receivers on noise. The 930 tracking receivers remember their last zeroing.   If a 930 receiver is power cycled, it does not have a valid zeroing value.   If the configuration of the 930 receiver changes the IF bandwidth, the prior zeroing value is invalid.   If a 930 receiver has a valid zeroing value, the consequences of not zeroing again during prepass are inconsequential. Else, it could result in autotracking on noise and the dish heading for a limit. Or it could result in not autotracking at all. The data signal strengths logged and displayed could also be misleading, if the software was just restarted without having the chance to zero those signal strengths as well.

Installation Procedure:

CSOC staff will install the new release remotely. It will be necessary to coordinate the time of the update with the operator and with ViaSat for phone support.

Please perform the following installation and activation and/or restore instructions on both McMurdo computers.

To install this release, first check to see that there is adequate disk space available by typing bdf. There should be at least 150MB available. If not, back-up to tape and then delete old unused releases in the /home/aaas/releases directory.

Install the Executables

1. Create a rel4.5.1 directory in the /home/aaas/releases directory.
2. Copy the file bin.tar.Z into this directory.
3. Uncompress bin.tar.Z
4. Untar bin.tar. This will create a bin directory with the new executables.

Setup the bin Directory

Copy the executables winPrint and pcltrans (if they exist) from rel2.3/bin to rel4.5.1/bin. Run a diff between NasaStart in rel2.3/bin and rel4.5.1/bin. If there are differences, then use the older version of NasaStart from rel2.3/bin.

Installation Procedure:

NOTE: These installation procedures will replace release 3.0 with release mgs4.5.1. When finished, the system will be configured to allow for running of the old release (mcm2.3) and the new release (mgs4.5.1). This configuration will make the system appear as if release 3.0 and release 3.2 were never installed. In the past, releases have been named **mcm**x.x. With this release (4.5.1) and into the future, releases will be named **mgs**x.x.

1. Make the following change(s) to the .cshrc file.

   - cd   /home/aaas
   - vi   .cshrc

setenv COPYETC_RELEASE mgs4.5.1

NOTE: If it becomes necessary to revert back to the prior release this change must be undone. See the Restore Procedures section of this document.

2. Create a new release directory:

   - mkdir   /home/aaas/releases/mgs4.5.1
   - cd   /home/aaas/releases/mgs4.5.1

3. Uncompress and untar the release:

   - uncompress   bin.tar.Z
   - tar   –xvf   bin.tar

   This should create a bin directory populated with the new executables.

4. Move the release mcm3.0 etc directory:

   - mv   /home/aaas/releases/mcm3.0/etc   /home/aaas/releases/mgs4.5.1/etc

5. For the purpose of regression, modify the links in /home/aaas/releasesmcm2.3/etc directory so they NO longer point at files in mcm3.0 but rather point to files in mgs3.2.

   - cd   /home/aaas/releases/mcm2.3/etc

   - rm ephtxt.txt
   - ln -s /home/aaas/releases/mgs4.5.1/etc/ephtxt.txt
           /home/aaas/releases/mcm2.3/etc/ephtxt.txt

   - rm CurrentSchedule
   - ln -s /home/aaas/releases/mgs4.5.1/etc/CurrentSchedule
           /home/aaas/releases/mcm2.3/etc/CurrentSchedule

   - rm sysdflt.bin
   - ln -s /home/aaas/releases/mgs4.5.1/etc/sysdflt.bin
           /home/aaas/releases/mcm2.3/etc/sysdflt.bin

   - rm config
   - ln -s /home/aaas/releases/mgs4.5.1/etc/config
           /home/aaas/releases/mcm2.3/etc/config

   - rm **log**/tapeentry.log
   - ln -s /home/aaas/releases/mgs4.5.1/etc/**log**/tapeentry.log
           /home/aaas/releases/mcm2.3/etc/**log**/tapeentry.log

   - rm **log**/tapehdr.log
   - ln -s /home/aaas/releases/mgs4.5.1/etc/**log**/tapehdr.log
           /home/aaas/releases/mcm2.3/etc/**log**/tapehdr.log

6. Make a script that will allow for executing the mgs4.5.1 release:

   - cd   /home/aaas
   - Use an editor to create an executable script named sw4.5.1. Its content should be:

```
            rm   /home/aaas/etc
            ln  –s  /home/aaas/releases/mgs4.5.1/etc   /home/aaas/etc
            rm   /home/aaas/bin
            ln  –s  /home/aaas/releases/mgs4.5.1/bin   /home/aaas/bin
```

- chmod +x sw3.2

7. Turn off the mcm3.0 release.

- cd /home/aaas
- rm sw3.0
- cd /home/aaas/releases
- mv mcm3.0 mcm3.0_obsolete

When it is decided mcm3.0 is not needed the following commands should be executed:

- cd /home/aaas/releases
- rm –Rf mcm3.0_obsolete

8. Fix the permissions on the time_code_handler executable:

- cd   /home/aaas/releases/mgs3.2/bin
- su   root
- chown   root   time_code_handler
- chmod   a+s   time_code_handler

9. Test the mgs4.5.1 release.

Activation Procedure:

SCC 4.5.1 activation procedure (**must be installed with ATS 3.3 or later**):

(1) Select option "Exit" from the "Session" menu. This action will close
the SCC graphical user interface (GUI) and stop all SCC processes.
Processes are stopped after "Stopping rci" and "Removing Stale Message Queues" messages
are displayed. Hit "enter" to display the SCC command prompt, "mgs >".

(2) Type "sw4.5.1" to switch to SCC release 4.5.1. Type "Start" to start
the SCC processes. The SCC GUI main window will show "McMurdo 4.5.1".

Restore Procedure:

SCC 2.3 restore procedure (**must be installed with a Master Release prior to ATS 3.3**):

(1) Select option "Exit" from the "Session" menu. This action will close
the SCC graphical user interface (GUI) and stop all SCC processes.
Processes are stopped after "Stopping rci", and "Removing Stale Message Queues" messages
are displayed. Hit "enter" to display the SCC command prompt, "mgs >".

(2) Type "sw2.3" to switch back to SCC release 2.3. Type "Start" to start the
SCC processes. The SCC GUI main window will show "NASA Version 2.3".

3) Make the following change(s) to the .cshrc file.

- cd   /home/aaas
- vi   .cshrc

      setenv   COPYETC_RELEASE   mgs2.3

<u>Documentation Affected:</u>

N/A

<u>Comments:</u>

Norm Cushing will support this software installation from ViaSat and his number is (678) 924-2545.

<u>Approval:</u>

The software modifications described in this release notice has been validated and accepted.

_____   _____
           NASA MGS Project Manager   Date

<u>SOFTWARE RELEASED:</u>

The software modifications described in this release notice have been completed and released to ground station operations.

_____   _____
           System Manager   Date

_____   _____
           NASA Program Monitor   Date

Attachment 1
MGS 4.5.1 Files

The bin Directory:

```
.StartAll
.StartUIF
AntennaControlStartup
CopyETC
Displays
Nasa
NasaStart
RestoreETC
Start
StartRemote
Stop
StopRemote
authent
chkgw
configud
control
dpsHndlr
errhandler
eup
executive
getNtpSyncInfo
ioh
pedcont
postPassShell
que_chk
rci
reccon
recsch
resetLANGateway
resetLANGateway2
resetLANGateway3
resetLANGateway4
resetLANGateway5
resetLANGateway6
resetLANGateway7
resetLANGateway8
resetLANGateway9
rmqs
schedmon
snyHndlr
start.awk
start_ntp
status_l
stop.awk
stop_ntp
sup
tapelog
terminal
testexec
time_code_handler
track
uactask
```

```
winPrint
```

The etc Directory:

N/A

The etc/hpib directory:

N/A

The etc/config directory:
N/A.